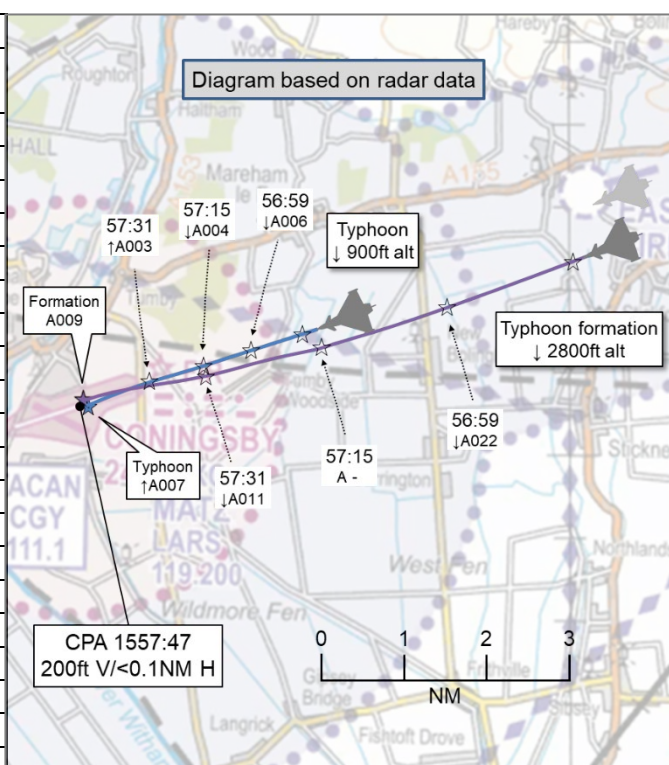


## AIRPROX REPORT No 2021237

Date: 25 Nov 2021 Time: 1558Z Position: 5306N 00009W Location: Coningsby ATZ

### PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Typhoon	Typhoon (Formation)
Operator	HQ Air (Ops)	HQ Air (Ops)
Airspace	Coningsby ATZ	Coningsby ATZ
Class	G	G
Rules	VFR	VFR
Service	ACS	ACS
Provider	Coningsby TWR	Coningsby TWR
Altitude/FL	700ft	900ft
Transponder	A, C, S	A, C
Reported		
Colours	Grey	Grey
Lighting	Anti-col, Nav	NR
Conditions	VMC	NR
Visibility	>10km	>10km
Altitude/FL	750FT	800ft
Altimeter	QFE (1015hPa)	QFE (1015hPa)
Heading	252°	259°
Speed	220kt	350kt
ACAS/TAS	Not fitted	Not fitted
Separation at CPA		
Reported	50ft V/20ft H	150ft V/100ft H
Recorded	50ft V/<0.1NM H <sup>1</sup>	



**THE TYPHOON PILOT** reports that they were flying a post-maintenance air test which includes an auto-ILS approach. This was combined with a gear-up approach to test the undercarriage warning system and was flown to DH. After this approach they climbed out on runway track to join the empty visual circuit and land. Just before changing to Tower frequency they were informed of traffic joining through initials<sup>2</sup>. On reaching approximately 750ft [the Typhoon formation] flight flew just over their right wing with an estimated separation distance of 50ft and proceeded to break into the circuit just in front of them. They joined the circuit once satisfied that there were just 2 aircraft in that formation then completed their circuit to land.

The pilot assessed the risk of collision as 'High'.

**THE TYPHOON FORMATION LEAD PILOT** reports that they were conducting a visual recovery from [the east]. A traffic call was passed from Approach frequency at **1455:13** with an aircraft 8.3NM away, same direction. The [other] aircraft was in the radar pattern cleared not above 2000ft and [they] were cleared not below 3000ft. A "traffic not sighted" call was made and both formation members [identified the track on their internal radar systems] on receipt of this call. [The other pilot in the formation] was the first to call visual with the aircraft 5NM in front of [the lead Typhoon]. They were at 3200ft and 350kts with auto throttle engaged. They called traffic in sight with the aircraft 4NM ahead and with 9NM to run to the RW threshold, [The formation] was at their 3000ft cleared height and they switched to Tower frequency at **1456:25**, and requested join at **1456:44**. They were 6NM from RW25 threshold and 3.5NM from the Typhoon with 225kts overtake. The response from Tower was cleared to join with one approaching 2NM gear up approach. After receiving this call from ATC, they passed that on chat frequency to [the other formation pilot] checking that they were still visual and expect to break early for deconfliction. Initial was called at **1457:10** at 3NM, having 210kts overtake and the Typhoon at a range

<sup>1</sup> CPA from HUD data. Diagram information based on NATS Ltd radar data.

<sup>2</sup> "Initials" is a point 3NM from the threshold which is slightly offset from the runway centreline on the deadside.

of 10000ft. They were still visual and the Typhoon was in the HUD FOV until **1457:40**. They made a correction to ensure deadside in-between **1457:37** and **1457:45**, this was requested from the ATC supervisor. The time at which the Typhoon stated in the debrief that they were closest to their jet was at time **1457:45**. At this time stamp, [the formation] was at 800ft QFE, 810ft rad-alt, auto-throttle engaged at 350kts and at [coordinates supplied], this measures approximately 100m/330ft north of the runway centre line. At the same time stamp, the singleton Typhoon had switched to Tower from Radar and requested a join, the response from ATC was "2 joining behind currently at initial", the response from the singleton Typhoon over the radio on stud 2 was "that was close" as they [the formation] passed over their right-hand side. They were content that they had maintained visual deconfliction.

The pilot assessed the risk of collision as 'Low'.

**THE CONINGSBY TOWER CONTROLLER** reports that they were prenoted 2 air systems to join the visual circuit, The [singleton] Typhoon was on radar at 8NM, and the Formation (2 in formation) to join visually. At 4NM they gave a clearance for Typhoon to fly through gear up circuit clear. Formation were approximately 6.5NM away. They relayed this clearance information to the caravan controller over MRE<sup>3</sup>, due to the standby caravan not having the appropriate and usual comms. The caravan controller acknowledged the clearance over MRE.

With radar traffic (singleton Typhoon) approaching 2NM and a positive clearance, the visual traffic (Formation) requested join. They gave Formation their joining instructions and called out the radar traffic that would be flying through gear up to join. Formation proceeded to continue and called initials, they were south of the centre line at this point and following the radar traffic. They [again gave Traffic Information on] the radar traffic (Typhoon) at 1NM and repeated their intentions. Formation called visual with Typhoon. A couple of seconds later the ATC Supervisor called them via landline and requested that they relay to the pair joining visually that they must remain deadside (they were live side). They repeated the message and it was acknowledged by Formation with the response of "affirm". Typhoon then transferred over to Tower and requested to join the visual circuit. They gave them joining instructions and called out the 2 air systems that had already reported visual with them. Typhoon responded with "that was close". Formation broke overhead the tower and because of this they lost visual sight of the formation. Due to the close proximity of all air systems they couldn't tell which air system was which. They then requested the position of Typhoon. While this was happening a returning priority air system requested to join the visual circuit. Typhoon confirmed that they were breaking late due to the pair on top of them. Formation lead reported visual and going around circuit height. They acknowledged that Formation lead had reported visual and requested the intentions of the other pilot in the formation. With no reply to this question, they were both sent around circuit height. The returning priority air system elected to hold outside of the circuit and orbit 10NM on the centre line. Typhoon then called downwind to land.

The controller assessed the risk of collision as 'Low'.

**THE CONINGSBY SUPERVISOR** reports that they were receiving a handover from the off-going supervisor in the ACR when their attention was drawn to the Approach controller telling their traffic about traffic on the display that "appeared to be joining on the live side". The off-going supervisor passed a message to the Tower controller to tell the joining traffic to position on the deadside. After completing the handover, they enquired further about the incident and assessed that the pilot joining from radar would probably phone post flight. They rang the authorisers on [the respective Squadrons] and briefed them on what had happened from an ATC perspective. Both the singleton pilot and the pilot of the lead aircraft in the formation rang post flight, and as it looked likely a report would be filed, they quarantined the frequency and radar recordings.

## Factual Background

The weather at Coningsby was recorded as follows:

METAR EGXC 251420Z 32013KT 9999 FEW047 06/00 Q1016 NOSIG RMK BLU BLU

<sup>3</sup> Management Radio Equipment

METAR EGXC 251450Z 32012KT 9999 FEW022 SCT250 06/00 Q1016 NOSIG RMK BLU BLU

## Analysis and Investigation

### Military ATM

The Coningsby Talkdown controller was providing an ILS monitor to the single Typhoon which was intending to fly through, gear up and join the visual circuit. All mandatory safety checks were conducted by the Talkdown controller and, as the Typhoon was passing their decision height, the Talkdown controller passed Traffic Information relating to an aircraft that appeared to be joining the visual circuit, live side, through initials which was acknowledged by the Typhoon pilot. However, this was only noted as a singleton and not a pair.

The Coningsby Approach controller had taken a handover of the pair of Typhoons which had requested a radar to visual recovery. Traffic Information on the single Typhoon was passed three times before the lead pilot of the Typhoon pair reported visual, with a final range update given when they were transferred to the Tower frequency. The pair of Typhoons had been prenoted into the Tower controller, as required by local orders, prior to being transferred to the Tower controller.

The Coningsby Tower controller had received the prenote for the pair of Typhoons and was conducting the required actions to support the pilot of the single Typhoon, who was conducting a radar approach. Broadcasts regarding the Typhoon pair's position were made as required after which the lead pilot of the Typhoon pair requested to join the visual circuit. A joining clearance was issued with associated Traffic Information relating to the single Typhoon which was updated when the lead pilot reported initials. The Tower controller, prompted by the ATC Supervisor, reminded the lead pilot of the Typhoon pair to remain on the deadside for their initials join which was acknowledged. The single Typhoon pilot then requested to join the visual circuit from their radar approach, which was approved, and Traffic Information was passed regarding the other joining Typhoon pair. Due to the Typhoon pair overflying the ATC Tower, situational awareness regarding which aircraft was which was lost until the Tower controller was able to confirm the Typhoon positions as they turned downwind.

The Coningsby Supervisor was undergoing a handover from the off-going Supervisor when their attention was drawn to the Talkdown controller due to the Traffic Information regarding the pair that appeared to be joining on the live side. The off-going Supervisor prompted the Tower controller to remind the pilot of the Typhoon pair to maintain deadside.

Figures 1 – 6 show the positions of the Typhoons at relevant times during the Airprox. The screenshots were taken from a replay using the NATS radars which are not utilised by the Coningsby controllers, therefore, may not be entirely representative of the picture available.

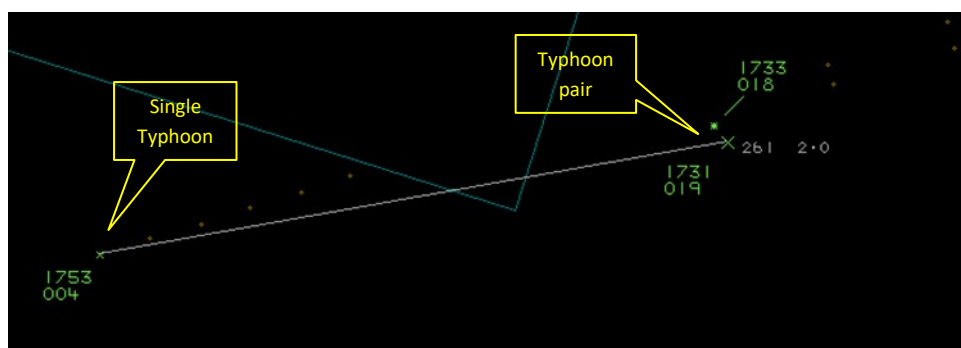


Figure 1 - Lead pilot of Typhoon pair reported initials.

Prior to reporting initials, the lead pilot of the Typhoon pair was given permission to join the visual circuit with one on a radar approach at 2NM to fly through, gear-up, and join. Thirty-one seconds later the lead pilot of the Typhoon pair reported initials. The Tower controller updated them on the

location of the single Typhoon which was on short finals to fly through gear up. Separation was 2NM and 1400ft.

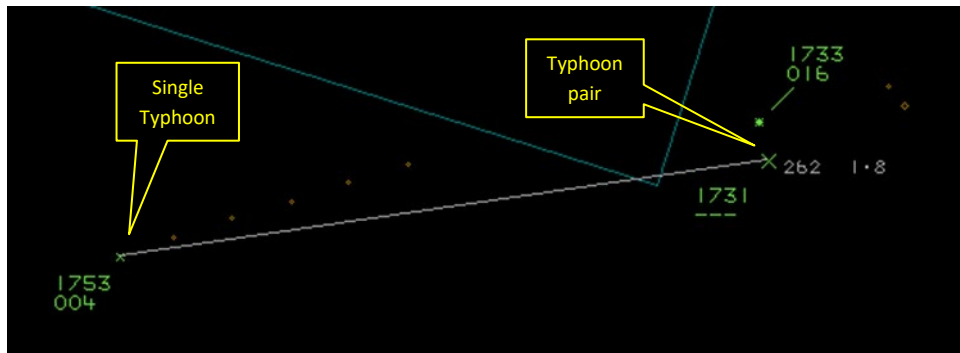


Figure 2 - Lead pilot of Typhoon pair reported visual.

Five seconds later the lead pilot of the Typhoon pair reported visual with the single Typhoon. Separation decreased to 1.8NM and 1200ft.

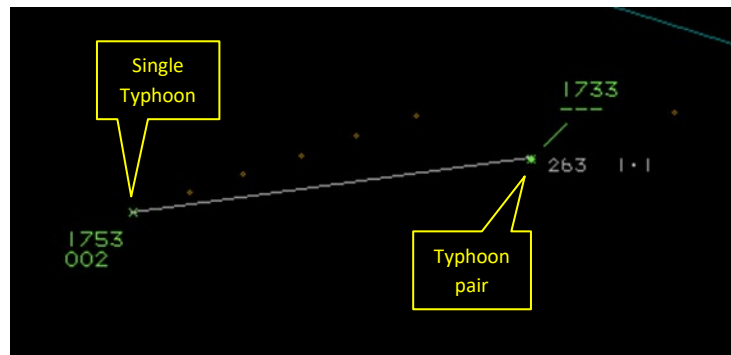


Figure 3 - Single Typhoon received Traffic Information and pair reminded to remain deadside.

The Talkdown controller, observing traffic on their radar screen, advised the Typhoon pilot of traffic which appeared to be joining the visual circuit on the live side. This was overheard by the ATC Supervisor who prompted the Tower controller to remind the lead pilot of the Typhoon pair to remain on the deadside. Separation decreased to 1.1NM and unknown height.

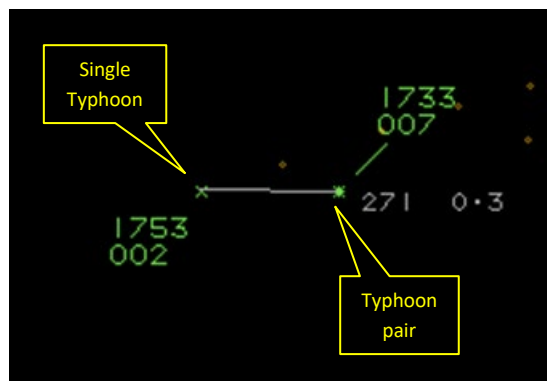


Figure 4 - Typhoon requests to join from radar.

Sixteen seconds later the single Typhoon pilot requested to join the visual circuit from their radar approach, which is approved by the Tower controller, who advised them that there were two joining from behind. Separation decreased to 0.3NM and 500ft.

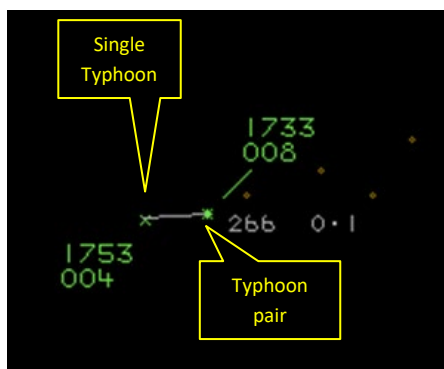


Figure 5 – Prior to CPA.

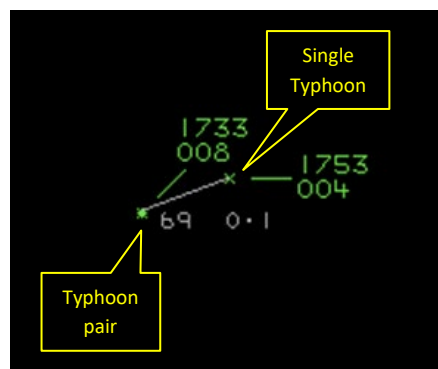


Figure 6 – Post CPA.

CPA appeared to occur between radar sweeps with the Typhoon pair overtaking the single Typhoon. Previously measured radar separation was 0.1NM and 400ft <sup>4</sup>.

A thorough investigation was conducted by RAF Coningsby which highlighted that the Traffic Information that was passed with the joining clearance to the single Typhoon pilot was inaccurate as the pair of Typhoons were overflying the singleton, not behind it. The Tower controller lost situational awareness due to the roof of the ATC building as the aircraft flew over which could account for the inaccuracy in the Traffic Information.

Accurate Traffic Information should have been passed to the single Typhoon pilot whilst on the Talkdown frequency in accordance with RA 3228 which stipulates the requirement for deconfliction minima until specified conditions are met for radar to visual recoveries which were not wholly met. RA 3228(4).c states that the Traffic Information is passed to the pilot of the air system conducting the instrument approach, regarding the air system conducting the radar to visual approach. Although Traffic Information was passed by the Talkdown controller it was inaccurate and passed as cautionary and assumed based on the flight profile. The Approach controller should have provided the Talkdown controller with accurate Traffic Information prior to allowing deconfliction minima to be lost which would have allowed better situational awareness to be passed to the single Typhoon pilot.

Although the provision of Traffic Information could have been better, a lack of adherence to local orders was identified as the cause of the Airprox by the unit investigation.

### UKAB Secretariat

The Typhoon pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.<sup>5</sup> An aircraft operated on or in the vicinity of an aerodrome shall conform with or avoid the pattern of traffic formed by other aircraft in operation.<sup>6</sup>

### Occurrence Investigation

The operating organisation for the singleton Typhoon conducted an investigation which established the sequence of events, time-line and resulted in a number of finding/conclusions which are summarised below.

- A single Typhoon (Typhoon) was conducting an ILS to fly through gear up (part of air-test) to join the visual circuit.
- A pair of Typhoons (Formation) were conducting a visual join to break into the visual circuit. They had radar contact on Typhoon at 7NM and were visual at 4NM. Internally, the pair had

<sup>4</sup> Differing radar heads with different update rates have been utilised by Mil ATM and UKAB in the determination of CPA however final CPA has been taken from recorded on-board HUD data.

<sup>5</sup> MAA RA 2307 paragraphs 1 and 2.

<sup>6</sup> MAA RA 2307 paragraph 17.

decided to maintain an overtake speed and planned to break ahead of the traffic joining from radar.

- ATC radar, GPS images of Formation track and HUD imagery all showed Formation to be consistently on the live side for the duration of approach, adjusting [to the deadside] overhead the threshold when prompted by ATC.
- The Typhoon received Traffic Information on traffic joining visually on the live side, though no mention of pair was made and the transmission was obscured by in-cockpit gear-up warnings.
- As the Typhoon was joining the visual circuit from Talkdown, Formation broke over the top. The Formation lead estimated the lateral separation to be approximately 150ft and [stated] that they were visual throughout, adjusting their aircraft attitude to maintain so.
- Information on Typhoon HUD indicates they were at 750ft, Formation were not below 800ft, giving 50ft vertical separation.
- All aircraft then established in visual circuit with Formation ultimately going around and Typhoon landing and streaming chute as part of their air-test.
- All aircraft were operating on the Coningsby QFE.

- 1454:18 Typhoon**, a singleton, changed to Talkdown frequency whilst conducting a gear up ILS approach to RW25 with further intentions to low-approach and join the visual circuit.
- 1454:21 Formation**, a pair, were identified and put under a Traffic Service by Coningsby Approach for a visual recovery.
- 1454:35 Formation** were given descent to 3000ft and passed Traffic Information on **Typhoon** as “12 o’clock 7NM, similar heading”, and told to report visual.
- 1454:53 Formation** were warned-in to Tower.
- 1455:23 Formation** had updated Traffic Information on **Typhoon** as “12 o’clock 7NM, similar heading, not above 2000ft”, and told to report visual.
- 1455:29 Formation** report that they are not yet visual with **Typhoon**. Though during interview they confirm they had the traffic on their aircraft radar.
- 1455:57 Formation** receive further Traffic Information on **Typhoon** as “12 o’clock 5NM similar heading”, **Formation** were still not visual.
- 1456:15 Formation** report visual with **Typhoon**. They then change to the Tower frequency after reporting visual with the aerodrome.
- 1456:35 Formation** call Tower for join.
- 1456:37** Tower gives **Formation** permission to join and advises them about **Typhoon**, now at 2NM for fly through gear up to join.
- 1457:08 Formation** call at initial.
- 1457:10** Position of **Typhoon** updated as short final, fly through gear up.
- 1457:13 Formation** confirm visual with **Typhoon**.
- 1457:24** The Talkdown controller was not aware that the traffic joining initials was a pair and passed Traffic Information to **Typhoon** as they were passing the procedure decision-height. It was given as “*caution, looks like one joining live side through initial*”. ATC radar replay shows **Formation** to be significantly displaced to the live side. At the same time **Formation** is being instructed to remain deadside by the Tower controller.
- 1457:31 Typhoon** acknowledged the Traffic Information from Talkdown controller and changed to the Tower frequency.
- 1457:40 Typhoon** calls the Tower controller for join.
- 1457:43** The Tower controller gives joining instructions to **Typhoon** giving Traffic Information on **Formation** as “*two behind you at er just joining initials*”. At this point the pair were already slightly ahead and breaking over the top of **Typhoon**. The Tower controller has stated that at this point all aircraft were obstructed by the ceiling of the Visual Control Room (VCR).
- 1457:51 Typhoon** states on frequency “*that was a bit close*”. **Formation** were on the break at this point.
- 1457:56 Formation lead** calls downwind for a touch and go. The Tower controller endeavours to ascertain the order of the aircraft in the visual circuit by asking **Typhoon** if they are the lead aircraft (turning downwind). **Typhoon** responds that they are upwind.
- 1458:12 Formation lead** calls an unknown agency stating “*Visual*”. It has not been clarified to what this statement refers.

**Formation** ultimately go around without conducting an approach to the runway. **Typhoon** continues their visual circuit and lands.

Findings and outcomes/actions are summarised as:

- The Formation "Initial" to "Break" had not been flown IAW FOB procedures and Typhoon had drifted approximately 100ft to the right of runway track. **Action:** Thorough debriefs by all elements have been conducted.
- Formation maintained visual contact with Typhoon at all times (maintaining a bank to do so throughout) and did not consider there to be an issue. **Outcome:** Upon review, Formation accept that from the perspective of Typhoon there were serious concerns about separation. Both crew members have taken lessons from the incident that they are confident will prevent them having the same occurrence in the future.
- Formation's join profile remained on the live side of the centreline throughout. Adjustment to the deadside only took place as they were over the threshold. To a lesser degree, Typhoon had also drifted slightly to the deadside whilst conducting the Low Approach to join the visual circuit, which to Formation looked more like a go-around than a low approach. Typhoon admits this drift was as a result of banking to maintain visual with the runway.
- The position of joining Formation given by the Tower controller to Typhoon was incorrect. It was given as [the pair were] behind at the same time as they were overtaking and breaking ahead. The situational awareness of the Tower controller was lost as Formation were obscured by the VCR ceiling, the controller then reverted to last known position which was when the aircraft had called at initials. **Action:** All VCR controllers to be briefed on the necessity to be as accurate as possible when giving traffic positions.

## Comments

### HQ Air Command

This Airprox was subject to a Local Investigation. There were no recommendations; nevertheless, both ATC and the Coningsby based pilots have been re-briefed on the accuracy of position calls when following the published procedures. As the Coningsby DDH states: "Although there were errors in both Typhoon and Formation, and a number of aggravating and contributory factors identified, the root cause of this appears to be a breakdown in basic airmanship and procedural following by Formation." The recorded separation at CPA was such that the risk of collision appeared Low; however, there was significant concern and startle factor from the Typhoon to feel that safety was compromised by the Formation breaking over the top of them. This Airprox highlights how critical it is to have full situational awareness and follow the published procedures to successfully integrate into the visual circuit.

## Summary

An Airprox was reported when a Typhoon and a Typhoon formation flew into proximity at RAF Coningsby at 1558Z on Thursday 25<sup>th</sup> November 2021. Both pilots were operating under VFR in VMC, and were in receipt of an ACS from Coningsby Tower.

## **PART B: SUMMARY OF THE BOARD'S DISCUSSIONS**

Information available consisted of reports from both pilots, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate operating authorities. Relevant contributory factors mentioned during the Board's discussions are highlighted within the text in bold, with the numbers referring to the Contributory Factors table displayed in Part C.

The Board first discussed the actions of the pilot of the singleton Typhoon and agreed that they had had inaccurate situational awareness (**CF10**) regarding the approaching formation as they had not been informed that the approaching traffic had been a pair. A military member stated that, as the Typhoon formation had been approaching the single Typhoon from behind, they would have been obscured from

the view of the Typhoon pilot (**CF14**) and this had lead to the pilot of the single Typhoon not becoming visual with the formation until after CPA (**CF13**).

Next, members discussed the actions of the Typhoon formation lead pilot. A military member stated that the Flying Order Book requires pilots to position to the deadside for joining, but that the Typhoon formation had joined the approach pattern on the live side (**CF6, CF7**). Members agreed that although formation lead pilot had been informed that the single Typhoon pilot had been conducting a gear-up fly-through, they had not assimilated this information (**CF11**) and had not adapted their re-join plan sufficiently to account for the increased speed of the single Typhoon (**CF8**). The Board then discussed the point at which the formation lead pilot had become visual with the single Typhoon and members felt that it had been at a point which it had been too late to build a complete mental model of the situation. It was agreed that the formation lead pilot had continued to fly in to conflict with the single Typhoon despite being visual (**CF12**) and that the formation lead pilot did not conform with the pattern of traffic that the single Typhoon pilot had established (**CF9**). A military member stated that a pilot should not execute such a join unless they are fully aware of the traffic situation with full situational awareness.

Board members then considered the actions of the ATSU and members noted that, due to insufficient internal coordination between controllers, the Talkdown controller had not been aware that the formation had been a pair and, as such, their situational awareness had been inaccurate (**CF5**). Members agreed that, as a result of the Talkdown controller's inaccurate situational awareness, they had passed inaccurate Traffic Information to the singleton Typhoon pilot (**CF1, CF2**). The Board were encouraged that the supervisor had made a timely intervention when they had directed the Tower controller to instruct the formation lead pilot to position to the deadside. Members agreed that inaccurate Traffic Information had also been passed to the singleton Typhoon pilot by the Tower controller when they had stated that the formation had been behind them (**CF1, CF2**). It was also agreed this information had been based on an assumed position of the formation (**CF4**) as the aircraft had been obscured from the controller's view by the visual control room roof. Members went on to agree that this had led to the Tower controller not detecting the conflict (**CF3**). A military ATC advisor stated that there are other systems available to the Tower controller, such as an ATM, to assist with situational awareness in situations such as this, which could have been utilised.

Finally, when assessing the risk of the Airprox, the Board considered that the singleton Typhoon pilot had had inaccurate situational awareness regarding the joining formation. The formation lead pilot had become visual with the singleton Typhoon at a range of 5NM however they had continued to fly toward it and ultimately into conflict. Although the formation lead pilot had been visual with the singleton Typhoon, members agreed that separation had been reduced to an extent that there had been a risk of collision (**CF15**) and that safety had been much reduced. Accordingly, the Board assigned a Risk Category B to this Airprox.

## **PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK**

### Contributory Factors:

	2021237			
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
<b>Ground Elements</b>				
<b>• Regulations, Processes, Procedures and Compliance</b>				
1	Human Factors	• ATM Regulatory Deviation	An event involving a deviation from an Air Traffic Management Regulation.	Regulations and/or procedures not fully complied with
<b>• Situational Awareness and Action</b>				
2	Human Factors	• ANS Traffic Information Provision	Provision of ANS traffic information	TI not provided, inaccurate, inadequate, or late
3	Human Factors	• Conflict Detection - Not Detected	An event involving Air Navigation Services conflict not being detected.	
4	Human Factors	• Expectation/Assumption	Events involving an individual or a crew/team acting on the basis of expectation or	



			assumptions of a situation that is different from the reality	
5	Contextual	• Traffic Management Information Action	An event involving traffic management information actions	The ground element had only generic, late, no or inaccurate Situational Awareness
<b>Flight Elements</b>				
<b>• Regulations, Processes, Procedures and Compliance</b>				
6	Human Factors	• Use of policy/Procedures	Events involving the use of the relevant policy or procedures by flight crew	Regulations and/or procedures not complied with
<b>• Tactical Planning and Execution</b>				
7	Human Factors	• Action Performed Incorrectly	Events involving flight crew performing the selected action incorrectly	Incorrect or ineffective execution
8	Human Factors	• Insufficient Decision/Plan	Events involving flight crew not making a sufficiently detailed decision or plan to meet the needs of the situation	Inadequate plan adaption
9	Human Factors	• Monitoring of Environment	Events involving flight crew not to appropriately monitoring the environment	Did not avoid/conform with the pattern of traffic already formed
<b>• Situational Awareness of the Conflicting Aircraft and Action</b>				
10	Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late, inaccurate or only generic, Situational Awareness
11	Human Factors	• Understanding/Comprehension	Events involving flight crew that did not understand or comprehend a situation or instruction	Pilot did not assimilate conflict information
<b>• See and Avoid</b>				
12	Contextual	• Loss of Separation	An event involving a loss of separation between aircraft	Pilot flew into conflict
13	Human Factors	• Monitoring of Other Aircraft	Events involving flight crew not fully monitoring another aircraft	Non-sighting or effectively a non-sighting by one or both pilots
14	Contextual	• Visual Impairment	Events involving impairment due to an inability to see properly	One or both aircraft were obscured from the other
<b>• Outcome Events</b>				
15	Contextual	• Near Airborne Collision with Aircraft	An event involving a near collision by an aircraft with an aircraft, balloon, dirigible or other piloted air vehicles	

Degree of Risk: B

### Safety Barrier Assessment<sup>7</sup>

In assessing the effectiveness of the safety barriers associated with this incident, the Board concluded that the key factors had been that:

#### **Ground Elements:**

**Regulations, Processes, Procedures and Compliance** were assessed as **partially effective** because the Talkdown controller had not been aware that the joining traffic had been a pair, and as such had been unable to pass accurate Traffic Information to the singleton Typhoon pilot.

**Situational Awareness of the Conflication and Action** were assessed as **partially effective** because the Talkdown controller had not known that the joining traffic had been a pair. Also, the Tower controller had been unable to see the aircraft when the Typhoon pair broke over the singleton

<sup>7</sup> The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).

Typhoon due to the roof of the control room, and they had issued Traffic Information based on assumed positions for the aircraft.

**Flight Elements:**

**Regulations, Processes, Procedures and Compliance** were assessed as **ineffective** because the Formation join not been flown in accordance with Flying Order Book procedures and the Formation had not conformed with the pattern of traffic which had already been established by the Typhoon pilot.

**Tactical Planning and Execution** was assessed as **partially effective** because there had been no adaption of the plan for joining the circuit by the Formation lead pilot and the execution of the join had not been in accordance with Flying Order Book procedures. The formation had then not conformed with the pattern of traffic which had already been established.

**Situational Awareness of the Conflicting Aircraft and Action** were assessed as **partially effective** because the singleton Typhoon pilot had not been aware that the joining traffic had been a pair and the Formation lead pilot hadn't assimilated the conflict information regarding the singleton Typhoon.

**See and Avoid** were assessed as **partially effective** because, despite having been visual with the singleton Typhoon, the Formation continued to fly in to conflict with it whilst the formation had been obscured for singleton Typhoon pilot who had not seen them until CPA.

Airprox Barrier Assessment: 2021237		Outside Controlled Airspace						
Barrier	Provision	Application	Effectiveness					
			Barrier Weighting					
			0%	5%	10%	15%	20%	
Ground Element	Regulations, Processes, Procedures and Compliance	✓	⚠	[Yellow bar to 5%]				
	Manning & Equipment	✓	✓	[Green bar to 5%]				
	Situational Awareness of the Conflication & Action	⚠	⚠	[Yellow bar to 15%]				
	Electronic Warning System Operation and Compliance	⊖	⊖	[Grey bar to 5%]				
Flight Element	Regulations, Processes, Procedures and Compliance	✓	✗	[Red bar to 10%]				
	Tactical Planning and Execution	✓	⚠	[Yellow bar to 10%]				
	Situational Awareness of the Conflicting Aircraft & Action	⚠	✓	[Yellow bar to 20%]				
	Electronic Warning System Operation and Compliance	⊖	⊖	[Grey bar to 15%]				
	See & Avoid	✓	⚠	[Yellow bar to 20%]				
<b>Key:</b>								
	Full	Partial	None	Not Present/Not Assessable	Not Used			
Provision	✓	⚠	✗	⊖	⊖			
Application	✓	⚠	✗	⊖	⊖			
Effectiveness	■	■	■	■	□			